AMINOPHYLLINE

DESCRIPTION AND INDICATION FOR USE

Aminophylline is a xanthine derivative that is converted to theophylline in vivo. The main pharmacological actions of theophylline are direct relaxation of bronchial smooth muscle, relieving bronchospasm and direct stimulation of the medullary respiratory centre. Therefore aminophylline and theophylline are used as a central nervous system stimulant in the management of apnoea of prematurity.

DOSE

For apnoea of prematurity:

IV: **Loading dose**: 10mg/kg

Maintenance dose:

Age < 7 days: 2.5mg/kg/dose 12 hourly

Age 8-14 days: 4 mg/kg/dose 12 hourly

Age > 14 days: 5mg/kg/dose 12 hourly

When to commence maintenance dose?
Weight ≤ 1 kg: commence 24 hours post loading dose
Weight > 1 kg: commence 12 hours post loading dose

RECONSTITUTION/DILUTION

Ampoule = 250mg in 10ml (25mg/mL)

IV:
1. Withdraw 1ml of 25mg/mL solution
2. Add to 9mL of Water for Injection in a 10mL syringe (concentration = 25mg/10mL = **2.5mg/mL)**
3. Use another syringe to withdraw exact dose

NOT FOR IM or SC USE

ROUTE AND METHOD OF ADMINISTRATION

IV: LOADING DOSE: give over 60 minutes by continuous infusion via a syringe pump

MAINTENANCE DOSES: give over 20 minutes by continuous infusion via a syringe pump

COMPATIBILITY INFORMATION

Please contact your ward pharmacist for information on drugs or fluids not appearing in the table below. Medications that are not routinely used in the Special Care Nursery have not been included in this table and may be incompatible.

	Compatible	**Incompatible**
Fluids	Dextrose 5%, Dextrose 10%, Dextrose 20%, 0.9% Sodium chloride	
Drugs	Calcium gluconate, Dopamine, Frusemide, Heparin sodium, Ranitidine	Cefotaxime, Dobutamine, Benzylpenicillin, Morphine, Phenytoin, Vancomycin

SIDE EFFECTS

- Tachycardia
- Irritability, Restlessness, Seizures
- GI tract upset
- Hypotension

SPECIAL PRECAUTIONS

- Caution in patient with gastrointestinal bleeding

DRUG INTERACTIONS

Some medications may decrease aminophylline clearance resulting in increased serum levels and the potential for increased toxicity for example: *β-blockers, thyroid hormones, macrolide antibiotics, quinolone antibiotics*

Some medications may increase the clearance of aminophylline, and thereby decrease serum concentrations, possibly resulting in subtherapeutic dosing for example: *phenobarbitone, carbamazepine, phenytoin, rifampicin*

Neuromuscular blocking agents, non-depolarising (eg: pancuronim)
Aminophylline may antagonise the neuromuscular blocking effects of these agents

NURSING RESPONSIBILITIES

- Observations/Monitoring:
  - Cardio/respiratory monitoring
  - Check heart rate prior to giving dose - if greater than 180 bpm consistently, refer to medical staff
- Therapeutic drug monitoring:
  Routine assessment of aminophylline serum levels is no longer necessary unless toxicity is suspected.

	Samples Required		**Therapeutic Range**	
	Trough	**Peak**	**Trough**	**Peak**
Aminophylline*	✔ (sample immediately pre-dose)	Not required	40 – 80 micromol/L (theophylline)	Not applicable

* Time to reach steady state following a loading dose or dose change is approximately 5 to 7 days